Case Presentation

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- 38 year old female patient with ESRD on Regular HD, married and has 3 offspring, the youngest aged 4 years.
- ***Regular HD*** was first initiated on Jan 2014, receiving 3 sessions per week, 4 hours each.
- Her DBW is around 56 Kg , Kt/V : 1.3
- She is hypertensive, Bp is controlled on ***CCBs & BBs***

- Patient showed up in the ER complaining of ***difficulty of breathing and chest tightness.***
- The condition started by gradual onset and progressive course of ***Dyspnea grade 4*** (at rest), and was associated with ***fever and rigor***.
- The condition is ***not*** associated with cough, expectoration, hemoptysis, or wheezes.
- The condition is ***not*** associated with other symptoms related to other systems.

- The patient claimed a ***+ve Hx of similar condition*** developed on December 2013 (**before HD initiation**) and was associated with hemoptysis.
- Back then she was admitted in Mansoura Fever Hospital
- Evaluation and ***exclusion of T.B was done*** and she was eventually managed as a case of ***pneumonia***
- Admission lasted for 3 weeks then patient was discharged.

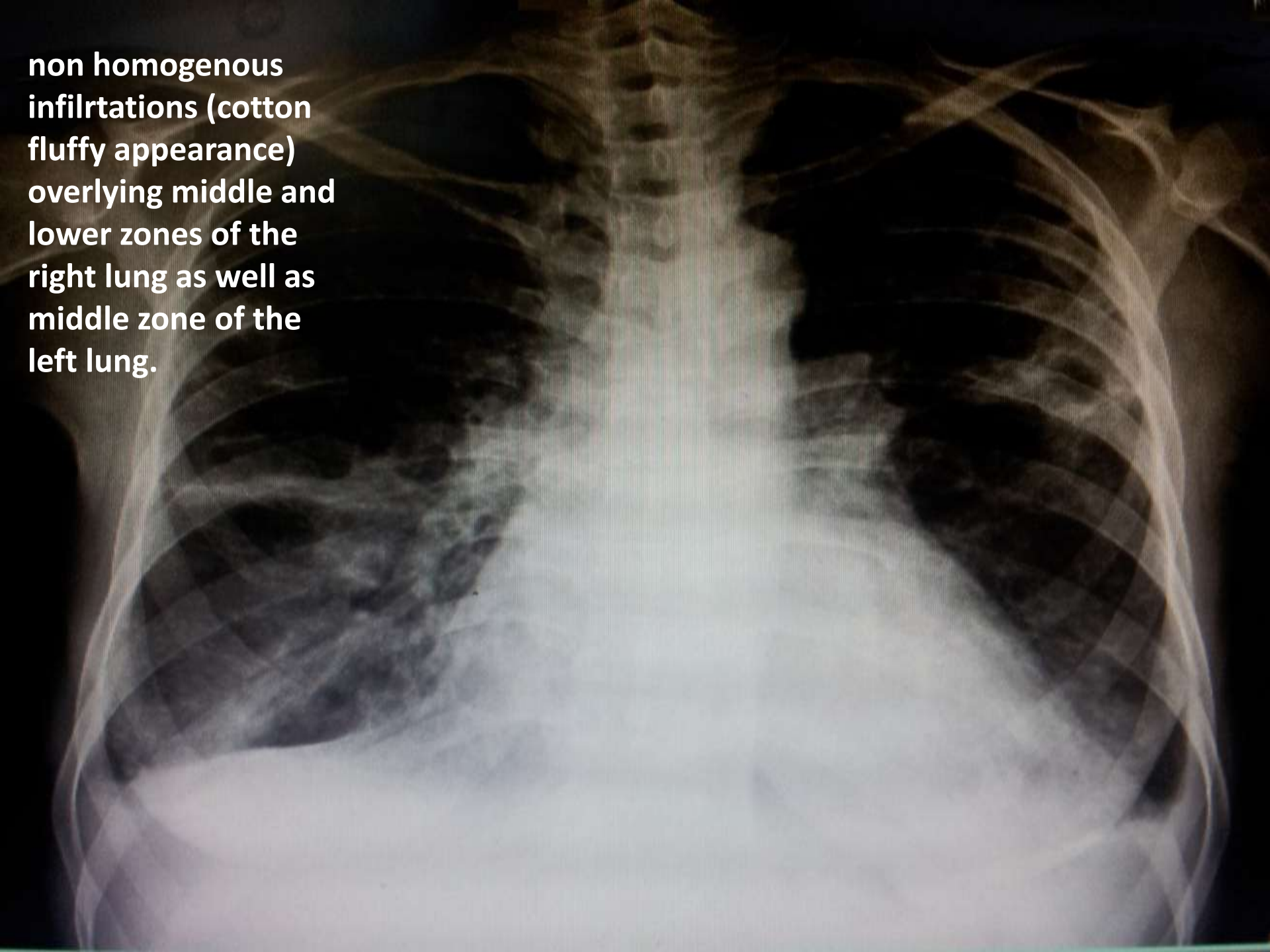
On clinical examination:

- Patient was conscious and cooperative
- appears ***ill and pale***
- RR : 20 cycles/m with ***rapid and shallow pattern of resp***, associated with ***grunting*** (nasal sound produced at the end of expiration)
- ***Tachycardia*** , Pulse: 130 bpm
- BP: 160/90 mmHg
- ***Temp: 42 C***
- Inspection of the chest revealed ***intercostal retractions***.
- Auscultation revealed: ***fine crepitation*** mid zonal and basal over the right lung, mid zonal over the left lung and ***scattered rhonchi***.

Lab was done

CBC	WBCs	RBCs	Plt	
	12.2 x10^3 with granulocytosis	HB: 7.1 gm/dl (Bl. Indices showing the pattern of micrcytic hypochromic anemia)	207 X 10^5	
ABG	**PH**	**$PaCO_2$**	**HCO_3**	**↓PaO_2**
	7.31	33.6 mmHg	18 mmol/L	96 mmHg
s.K	5.7 mEq/L			
s.Na	128 mEq/L			

CHEST X-RAY


non homogenous
infilrtations (cotton
fluffy appearance)
overlying middle and
lower zones of the
right lung as well as
middle zone of the
left lung.

Based on Hx. Clinical examination, lab and chest Xray……

We are facing a case of bronchopneumonia

- **Is it CAP (community acquired pneumonia) ??**

  within 1st 48 hs of hospital admission

- **Is it HAP (Hospital acquired pneumonia) ??**

  48-72 hours after hospital admission

- **Is it HCAP (Health care associated pneumonia) ??**

  CAP in recent contact to health care system

(Guidelines for the management of adults with hospital acquired, ventilator associated, and healthcare associated pneumonia. Am J Respir Crit Care Med 2005;171:388 -416.

Risk Assessment

based on the ***PSI***
(pneumonia severity index)

Risk Factor	Point Value
Age	
Men	Age (in yr)
Women	Age (in yr) –10
Nursing home resident	+10
Comorbid Illnesses	
Neoplastic disease	+30
Liver disease	+20
Kidney disease	+10
Cerebrovascular disease	+10
Congestive heart failure	+10
Physical Findings	
Altered mentation	+20
Tachypnea (>30 breaths/min)	+20
Systolic hypotension (<90 mm Hg)	+20
Body temperature (<35° or >40° C)	+15
Heart rate >125 beats/min	+10
Laboratory and Radiographic Findings	
Blood pH (arterial) <7.35	+30
Hypoxemia (arterial Pao_2<60 mm Hg or O_2 saturation <90%)	+10
Serum urea nitrogen (BUN) >30 mg/dL	+20
Na <130 mEq/L	+20
Blood sugar >250 mg/dL	+10
Anemia (hematocrit <30%)	+10
Pleural effusion	

Kidney disease	+10
Body temperature (<35° or >40° C)	+15
Heart rate >125 beats/min	+10
Blood pH (arterial) <7.35	+30
Serum urea nitrogen (BUN) >30 mg/dL	+20
Na <130 mEq/L	+20

Decision was taken for Hospital admission

Patient received the following:

- **Empirical Antibiotics**: (*according to local hospital protocols*)
  Levofloxacin ***500 mg infusion /48hs,***
  (Ampicillin,Sulbactam"{B lactamase inhibitor}) ***(1.5 mg/12hs)***

- **Plus supportive therapy**:

  Antipyretics, antihypertensive, proton pump inhibitors, calcium supplementation

- **Bl culture sample** **(before the administration of antibiotics)**

(Admission lasted for a week and patient was improving clinically)

Bl Culture results: -ve

Temp ↓	37.2 c
Pulse	100 bpm
Bp	130/80
WBCs	6.5 X 10^3

Discharged on……

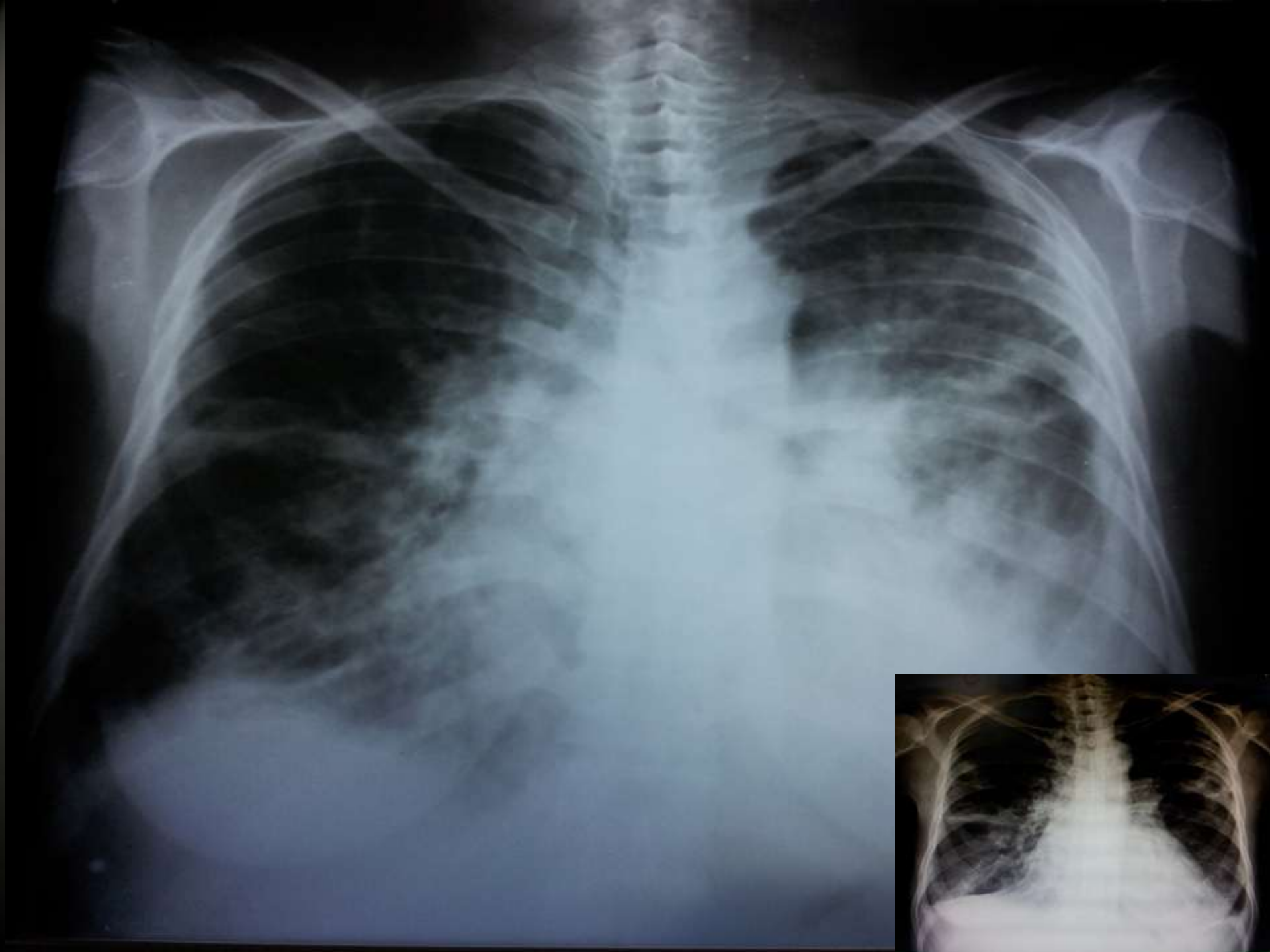
- ***Azithromycin*** ***500 mg/24 hs*** (for 3 days)
- ***Levofloxacin*** ***500 mg EOD*** (for 5 days)

Follow up has been processed in the form of serial clinical examination, imaging and lab

(10 days post_discharge)

Patient was represented by :

- ***Extreme fatigability***
- ***Dyspnea, Orthopnea***
- ***Productive cough, whitish scanty sputum***
- Chest examination : bilateral ***fine crepitation*** mid zonal and basal associated with ***rhonchi***



non resolving pneumonia ??

- ***Deficient management*** ?? (dose, duration ???)
- ***Inappropriate therapy*** ??(misdiagnosis of the pathogen (fungal, viral) ??or the presence of a resistant pathogen (Pseudomonas aeruginosa, secondary infection, such as post influenza staphylococcal pneumonia)??
- ***development of complications from the initial infection***??
- ***noninfectious etiologies of pulmonary infiltrates***

(cancers, pulmonary edema, pulmonary embolus, pulmonary hemorrhage, connective tissue diseases, or drug toxicity

- ***Immune deficient state of the patient***

Revise

Empirical Antimicrobial Therapy for Community-Acquired Pneumonia In Immunocompetent Adults

Clin Infect Dis 2007;44 Suppl 2:S27-S72.

Patient, Setting	Common Pathogens	Empirical Therapy
Outpatients		
<60 yr No comorbid diseases	*Streptococcus pneumoniae* *Mycoplasma pneumoniae* *Chlamydia pneumoniae* *Haemophilus influenzae* *Viruses*	Macrolide or doxycycline
>65 yr or with comorbid disease or antibiotic therapy within last 3 mo	*S. pneumoniae* (drug-resistant) *M. pneumoniae* *C. pneumoniae* *H. influenzae* Viruses Gram-negative bacilli† *S. aureus* †	Macrolide or doxycycline fluoroquinolone* Beta-lactam¶ and macrolide
Inpatients		
Not severely ill	*S. pneumoniae* *H. influenzae* Polymicrobial Anaerobes *S. aureus* *C. pneumoniae* Viruses	Macrolide and cefotaxime or ceftriaxone, or beta-lactam or beta-lactamase inhibitor¶; fluoroquinolone‡ alone
Severely ill	*S. pneumoniae* § *Legionella* spp. Gram-negative bacilli *M. pneumoniae* Viruses *S. aureus*	Azithromycin, or fluoroquinolone‡ and cefotaxime, ceftriaxone, or beta-lactam or beta-lactamase inhibitor¶ If *P. aeruginosa* possible—IV macrolide or fluoroquinolone and aminoglycoside IV, or antipseudomonal quinolone and antipseudomonal beta-lactam If MRSA possible, add vancomycin or linezolid

Pathogen-Specific Therapy for Community-Acquired Pneumonia in Adults

Mandell LA, Wunderink RG, Anzueto A, et al; Infectious Diseases Society of America; American Thoracic Society: Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in dults. Clin Infect Dis 2007;44 Suppl 2:S27-S72.

Organism	Primary Therapy
Streptococcus pneumoniae, penicillin-susceptible	Penicillin G; amoxicillin
S. pneumoniae, penicillin-resistant	Cefotaxime, ceftriaxone, fluoroquinolone, vancomycin, others, based on susceptibility studies
Haemophilus influenzae	Second- or third-generation cephalosporin, doxycycline, beta-lactam or beta-lactamase inhibitor, azithromycin, TMP-SMX
Moraxella catarrhalis	Second- or third-generation cephalosporin, TMP-SMX macrolide, beta-lactam or beta-lactamase inhibitor
Legionella spp.	Macrolide, tetracycline, fluoroquinolone alone
Mycoplasma pneumoniae	Doxycycline, macrolide
Chlamydia pneumoniae	Doxycycline, macrolide
Anaerobes	Beta-lactam or beta-lactamase inhibitor, clindamycin
Enteric gram-negative bacilli	Third-generation cephalosporin ± aminoglycoside; carbapenem
Pseudomonas aeruginosa	Aminoglycoside + ticarcillin, piperacillin, mezlocillin, ceftazidime, cefepime, aztreonam, or carbapenem
Staphylococcus aureus, methicillin-susceptible	Nafcillin or oxacillin
S. aureus, methicillin-resistant	Vancomycin or linezolid
Bacillus anthracis	Ciprofloxacin or doxycycline + two of the following: rifampin, vancomycin, penicillin, ampicillin, chloramphenicol, imipenem, clindamycin, clarithromycin
Influenza A, within 48 hr of symptom onset or immunocompromised host	Amantidine, rimantadine, oseltamivir, zanamivir
Influenza B, within 48 hr of symptom onset or immunocompromised host	Oseltamivir, zanamivir

History	Associated Organisms
Alcoholism	*Streptococcus pneumoniae*, oral anaerobes, *Mycobacterium tuberculosis*
Chronic obstructive lung disease (COPD)	*S. pneumoniae*, *Haemophilus influenzae*, *Moraxella catarrhalis*, *Legionella* spp.
Exposure to bat or bird droppings, construction sites, caves	*Histoplasma capsulatum*
Exposure to birds	*Chlamydia psittaci*
Exposure to rabbits	*Francisella tularensis*
HIV infection	"Typical" bacterial pathogens, *M. tuberculosis, Pneumocystis jiroveci*, cytomegalovirus, *Cryptococcus* spp., *Histoplasma* spp., *Coccidioides* spp.
Travel to desert, southwest United States	*Coccidioides* spp., Hantavirus (Sin Nombre virus)
Farm exposure	*Coxiella burnetii* (animals), *Aspergillus* spp. (barns, hay)
Postinfluenza	*S. pneumoniae, S. aureus, Streptococcus pyogenes, H. influenzae*
Aspiration	Mixed aerobic, anaerobic
Marijuana smoking	*Aspergillus* spp.
Anatomic abnormality of lung parenchyma, e.g., bronchiectasis, cystic fibrosis	*Pseudomonas aeruginosa, Burkholderia cepacia, S. aureus*
Injection drug use	*S. aureus*, anaerobes, *M. tuberculosis*, and *S. pneumoniae*
Obstruction of large airway	Anaerobes, *S. pneumoniae, H. influenzae, S. aureus*
Incarceration	*M. tuberculosis*
Neutropenia	*Aspergillus* spp., Zygomycetes
Asplenia	*S. pneumoniae, H. influenzae*

We added:

- ***Cefepime*** **500mg iv once/ 24hs for 5days**
- ***Vancomycin*** **500mg infusion post dialysis sessions every 3 days (3 doses)**

Chest consultation recommended:

Sputum gram stain
Sputum culture
Work up for evaluation of possible viral infection (IF, PCR)
Continue on recent prescribed medication till results appear

- **Asked for:**

➢ Sputum stain (Gm and acid fast) and culture for TB

➢ Unfortunately viral PCR hasn't been done due to limited financial resources

Two weeks later

CULTURE RESULTS

???

-VE

During follow up

- Patient is clinically stable with less acute chest symptoms every now and then (in the form of cough and expectoration)
- Chest Auscultation remain unchanged
- Radiological findings as well

Next step

Are we in need for……

- chest CT scan ???
- Bronchoscopy and trans bronchial biopsy ??
- Radiographically guided transthoracic aspirate

To be continued ……

As a closure

- National renal registry studies rank ***infection*** as the second most frequent cause of death, with ***one-quarter*** of these attributed to ***pneumonia*** causes(National Institute of Diabetes and Digestive and Kidney Diseases; 2006

- Death rates from pulmonary infections are about ***15 times higher in dialysis patients*** than in the general population Chest 2001
- The ***causative agent*** of community-acquired pneumonia remains ***unidentified in 30% to 50%*** of cases
- Using ***molecular*** techniques and **PCR** can help in difining difficult to culture organisms
- The ***pneumococcal vaccine*** has been shown to be 60% to 70% effective in patients who are immunosuppressed by chronic disease or treatment and should be considered for ***revaccination after 6 years***

MMWR Morb Mortal Wkly Rep. 2005, 54: (RR-08): 1-40


Thank you